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VARIOUS.

FURNITURE POLISH.

The following is a good preparation for polishing articles of furniture, objects covered with leather, floors, &c. Let 51 grammes ($1\frac{3}{4}$ oz.) of stearine finely shaved be put in 72 grammes ($2\frac{1}{2}$ oz.) of heated oil of turpentine, and after being melted, be left to cool. A salve will be produced which should be applied in small quantities to a woollen rag. The article to be polished must be well rubbed with this, and lastly wiped with a clean dry cloth.

Polytechnisches Notiz-Blatt.

FIRE-DIVING APPARATUS.

Practical experiments were lately made at Berlin with Herr Oeftberg's apparatus for enabling persons to penetrate fire and move about in the midst of flames without injury. The costume consists of two coverings, the inner made of india-rubber, and the outer of leather. The head is covered with a helmet like those of divers, with two openings in front to look through.

A single pipe fastened to the girdle conveys both air and water. The air-pipe, fed by a pair of bellows, is inside the water-pipe, and conveys the air, cooled by the water, to the inner part of the costume. The air inflates the costume and then escapes through the two small sight-holes. By this constant current of air not only is air continually supplied, but smoke and flame are blown away.

The water-pipe is divided at the back into two halves, one of which branches off as an extinguishing pipe, while the other, leading to the outside of the costume, continually pours streams of water over it through many small channels, and thus surrounds the apparatus with a flowing layer of water. Valves are ingeniously contrived for the regulation of the streams of air and water.

The apparatus underwent the recent trial with complete success. The fire-diver was able to remain quite twenty minutes in a square of lighted wood-heaps, which sent forth a heat from the outside preventing approach within twenty paces. The firm of Brandt and Nawrocki, of Berlin, are the sole agents for the sale of the apparatus.

Deutsche Industrie-Zeitung.

THE BATHOMETER.

This title is given to an invention of Dr. W. Siemens for measuring depth. This skilful engineer takes a vertical tube full of mercury, like a barometer, only the tube is of steel, and widens at its two extremities in the shape of a cup, to increase the terminal surface of the mercury. Then the lower cup is closed by a sheet of flexible steel, on which the whole weight of the column of mercury rests. Two powerful springs which go along the tube support the thin sheet of steel at its centre, and consequently the weight of the mercury. The liquid is in some sort suspended on the springs. If the weight of the column increases, the springs give way and the sheet bends; if the weight diminishes, the springs restore the sheet to its original state.

But it is evident that, when the sheet of steel bends, the level of the mercury in the upper cup sinks, and conversely it rises if the sheet is forced inwards. The changes of level of the liquid in the upper cup consequently indicate the changes of weight. Hence it is only necessary to register automatically by a very simple electric system the fluctuations of the mercury, in order to know at every instant what is the variation of weight, and from that what is the depth. The bathometer indicates changes of gravitation, as the barometer indicates changes of atmospheric pressure.

Evidently nothing more is needed than to cast a glance at its indications, in order to know immediately whether you have much or little water below you, whether you are passing over a valley or a submarine mountain. When the curves of the level of the ocean are obtained, a ship will be able to determine its position without astronomical calculations in case of need, by the mere knowledge of the depth from the indications of the bathometer. The instrument has already assisted in finding the end of an electric cable lost at the bottom of the sea, and in two voyages it has given the depths within a tenth. In fact, with the bathometer is obtained, not the exact depth under the ship's keel, but the average depth of a certain neighbouring zone which influences the instrument by its attraction. If the expectations to which the bathometer gives rise are fulfilled, Dr. W. Siemens will have created one of the most powerful instruments of investigation that modern physical science can possess.

The Practical Magazine from the Bulletin Français.

THE VENTILATION OF THEATRES.

Dr. T. Hübner, in the course of experiments made at St. Petersburg on the various changes of the atmosphere in the theatre, found that the temperature changed from 42° F. at the rising of the curtain to 81° and 87° at the end of the first act and the beginning of the second. He also found that the proportion of moisture increased 30 per cent., that the quantity of carbonic acid had become at the end of the second act six times as great as at the commencement of the performance, and that at the end breathing was very difficult for persons accustomed to live in the open air.

Revue Industrielle.

ELECTRO DEPOSITS.

Prof. Kick, of Prague, has published some important results of experiments in the formation of electro deposits. According to him, uniform and tenacious metallic deposits may be obtained with strong as well as weak currents, if the decomposing fluid or electrolyte is rightly selected. For a copper deposit on old bed-dies not affected by the fluid, a solution of copper with an addition of sulphuric acid to 7 per cent. is most suitable. The best bath is produced by a solution of sulphate of copper or blue vitriol 15° to 20° Baumé, strengthened with sulphuric acid 1° to 2° Baumé. To obtain a firm adherence of the metal coating, especially silver on brass, the cathode or negative pole must first be changed to the anode or positive pole for a short time, and the current afterwards changed. For coppering iron, mix one part of copper solution about 18° Baumé with 4 parts of water, and add one-eighth of a part of sulphuric acid. Well-cleaned iron need only be dipped in this fluid for an instant to be covered with a firm coating of copper.

Maschinenbauer.

CEMENT FOR JOINING METALS WITH NON-METALLIC SUBSTANCES.

To obtain a cement suitable for joining metals and non-metallic substances, mix liquid glue with a sufficient quantity of wood-ashes to form a thick mass. The ashes should be added in small quantities to the glue while boiling, and constantly stirred. A sort of mastic is thus obtained, which, applied hot to the two surfaces that are to be joined, makes them adhere firmly together.

A similar substance may be prepared by dissolving in boiling water $2\frac{1}{4}$ lbs. of glue and 2 oz. of gum ammoniac, adding, in small quantities, about 2 oz. of sulphuric acid.

Revue Industrielle.

VARNISH FOR ORNAMENTAL IRON WORK.

A varnish for small or large metallic articles can be prepared, say the *Industrie Blätter*, in the following manner. Finely pulverised gum sandarac or mastic (the latter, however, is too expensive for some uses) is dissolved in strong potash lye until it will dissolve no more. The solution is diluted with water and precipitated with a solution of a copper salt, either sulphate or acetate. This green precipitate is washed, dried and dissolved in oil of turpentine. This produces a green varnish, which does not change under the effect of light, and will be useful for ornamental iron work.